

More Dry Plate
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Temperature Control

How to control the temperature of liquid emulsion.

The easy way is to use hot water from the tap to melt it. My hot water tank is set on the default arrow and is 130 degrees Fahrenheit. The dial may be set lower or higher. A container is filled with the hot water and a jar of emulsion is floated in it. The temperature will drop over time to 110 degrees and it must then be raised again in order to get all of the emulsion to liquify by the time it is cooled again. More water will hold temperature longer than a small quantity. A small office or bathroom sized plastic trash container is used to melt a bottle of Liquid Light. Emulsion is solid at room temperature. It takes a while to do this but at lower temperatures, say 120 degrees, it takes an hour or longer. So it is best to start higher at 130 degrees F. Close monitoring of temperatures will speed things along.

During pouring plates, emulsion flows better when it is warmer. I aim at 120 degrees F. because that worked for me. During another test, if the temperature is lower, 110 degrees F., a surfactant may be added to improve flow. 5 ml of Everclear pure grain alcohol in 25 ml Liquid Light worked for me. However, bubbles were a problem in the photograph. I hand stirred the mixture in a film canister, using the thermometer, 100 times. A 35mm film canister holds 30 ml of emulsion. Leaving 1/4 inch or 3/8 inch at the top provides room for 5 ml of surfactant.

A new piece of equipment in my darkroom is a mug warmer. I thought it only went up to 110 degrees F. That is why the temperature of the last emulsion melting experiment was at 110. I wanted to see if Everclear did indeed work at increasing flow and it did.

Further testing of the mug warmer showed a high temperature of 120 and perhaps a little bit more. A stainless steel mug fits perfectly on the hot plate. If that cup is filled with warm water to begin with, the mug warmer will reach 120 degrees in under an hour and stay at that level.

A full 35mm can of cold emulsion put into the mug will lower the temperature of the water, however. There isn't enough volume of water to compensate. The canister should be preheated. Don't use the mug to melt the emulsion first, use the large Pyrex measuring cup. The mug warmer may be used to keep the can warm during pouring two 4x5 glass plates.

Dry Plate Photography

is what I like to show and tell about. This camera is an Ultra Large Format one that is 12 " x 15" It uses a book form dry plate holder, not the usual sliding kind. Glass must be hand coated in a darkroom with liquid emulsion. Contact prints or computer scans are made from the negatives. The lens has no shutter and the cap is taken off and put on instead. I have a darkroom in my cellar, yea, a wet, chemical old type darkroom. It is new. I also have collected many cameras of this type in different sizes to use in my making or dry plate photography. There are also many different lenses to use. I make lens boards so the lenses can be used on different camera bodies. Special flanges have to be made by a speciality photography machine shop so the lenses can be screwed onto other boards. Bellows have to be repaired. Restorations are made where needed to get the cameras to work.

I'd like to teach other people to use this kind of photography. I used to teach art in public and private schools professionally.

That is what I like to do, teach art. Lots of different kinds of art. Drawing, painting, printmaking, animation, filmmaking, video production, books, lots of different things. Dry plate photography isn't the only thing I do or have done.



12x15 Camera

There used to be some very helpful pictures on the web about how to pour a plate with liquid emulsion. They were difficult to get to, you had to know where to look for them. Now they are gone. Or, at least I no longer know where to find them. There was also a 10 page article about the dry plate photographic process that is no longer available. Good thing I downloaded them. No, I cannot publish them here because they belong to someone else. They are good resources for me. But, I can photograph myself pouring plates and I can write about the process then post them here. This web site is about Dry Plate Photography and I am an art teacher.

There **is** another web site devoted to the Dry Plate Photography process, it is called The Light Farm. It is the only such site that I have ever seen. Fantastic as it is, I still want my own site that is about the same subject. That one may go away, may it stay forever. I like different resources to learn from. I learn by doing and writing is a big part of how I learn. By making a web about what I am learning I will learn better. Besides, someone else may come on board and do some work here, too. Comments are open so viewers may participate. My approach is different and unique to me. There is at least one article on The Light Farm that I wrote. However, everything that I want to write about can't be put there. So, I have this site.

Today I scored a cooler for ice in the darkroom. I was leaving the gym and went next door to the Re-Store, Habitat for Humanity recycle store, and found a .75 cent cooler! BINGO, I said.

That'll go nicely with the water heater I bought on ebay. The Light Farm has very good photographs showing lab equipment to get or at least what was used in the article. I looked up the name on the web off the heater in the photo and found a new one. It was cheap enough for me so I bought it. That pair of items puts me just that much closer to making my own emulsions in my darkroom.

History

Dry Plate photography was invented by Dr. Richard L. Maddox in 1871. Charles Bennett invented a method of hardening the emulsion in 1873. It became more resistant to friction. He also discovered that by heating emulsion for a long time or a longer than usual time the speed of the emulsion was increased greatly.

George Eastman developed a plate coating machine in 1879.

Wikipedia

George Eastman began to study photography in 1877 using wet plate methods. He subscribed to the British Journal of Photography and in the first issue he received read that Charles Bennett had made dry plates faster in exposure to light. George Eastman used to make his own emulsions and pour it from a teakettle onto glass plates, using a glass rod to move it around. Then he invented a machine to do it.

Dry plate photographers advertised greatly in photographic journals in the mid 1870s.

Everyone used to make their own dry plates.

pbs.org the Wixard of Photography

Joseph Wilson Swan is said to have invented the dry plate in 1871 also.
(The Cambridge Biographical Encyclopaedia)

In 1878 dry plates were produced greatly because of experiments by J Burgess and Richard Kennett that made stable emulsion and greater sensitivity.

By 1880 sensitivity was so great that only a fraction of a second was required to expose a plate.

edinphoto.org.uk, Early Photographic Processes, Dry Plates

I guess I am to become an amateur dry plate manufacturer. They are so slow now that I could run and get into the picture before the cap is to be replaced over the lens.

My Darkroom

I have a home darkroom, a cottage industry, making dry plates. Starting with the very simplest materials and tools, I have made dry plate negatives. My work is documented, noted, printed into books, and shared on the internet. I too am excited to do this work as were the gentlemen of old. Photographic materials are readily available today as they were in 1880. Try prolonged heating of emulsion during the ripening stage to increase sensitivity like Charles Bennett did in 1878.

<http://www.thelightfarm.com/Map/Books/cim/MapTopic.htm>

Check out the following helpful sites to restore old field cameras:

Learning alternate photography process-

<http://www.alternativephotography.com>

Bellows made in the US

(a)-<http://www.turnerbellows.com/index.html>

(b)- <http://www.gortite.com/applications/camera-bellows>

Bellows made in the UK -

<http://www.custombellows.co.uk>

Darkroom Supplies

While away for holidays, I did some darkroom shopping. The Light Farm web site has great directions on what is needed in order to make emulsions. Several items were purchased online. Jelly bags, a potato ricer, and a digital scale sensitive to 0.01 g.

My sister in law has a food warmer that I coveted because it has a temperature dial with a lot of numbers on it. Looking on ebay, under vintage hot plates or food warmers, I found several! That was not purchased, yet. Wait, I just did it. Got a stop watch, too.

While looking at lists of things to buy on The Light Farm, I looked in my darkroom and found two contact frames that I can use, a 4x5 and a 8x10. The glass comes out and the dry plate goes in just fine thank you.

Other ones in the darkroom are small weird sizes including a large 11x14 that I cannot use and one that is way bigger than that! They will have to be sold at some point.

On Wednesday I got a small food warmer for a buck at the local ReStore. It only heats up to 120 degrees F. Nice. A large food warmer tray heats up to 138 and 148 so not so nice. It was less than \$3. Back it goes.



Thursday I went to many different shops and got this stuff. The big pot will do nicely when I make Large Format batches of emulsion. Pyrex bowls with plastic lids are common. Stainless steel spoons, cups, and a whisk were not so easy to get. The cooler will be used to wash emulsion with ice water. A one cup Pyrex measuring cup was bought. I also have a 2 cup and a 4 cup but there are no larger ones sold. The ricer is really heavy duty and arrived in the mail today along with a digital scale. More stuff is on the way.

Another delivery Thursday brought jelly bags and a stop watch. The stop watch is my favorite and will get used down at the local track when I do my jogging. It'll also get used timing emulsions.

Friday I ordered on-line beakers and graduated cylinders.

Contact Printing Frames

Earlier, I said that my excess contact printing frames were to be sold. That is not true any more, at least, not for the big ones. More was revealed by reading, studying, The Light Farm. Those large contact printing frames are perfect for Digital Negatives. If I only knew how to make digital negatives. But, I have printed on acetate. That was for traditional cel animation. So, something of a beginning has been made. Anyway, it is possible to scan 12x15 glass plates, make digital negatives and contact print them on my own (soon to be attempted) hand coated, hand made emulsion, photo print papers. After reviewing TLF site more, again, I remembered that the digital negative thing is why I bought the frames in the first place.

TLF

The Light Farm web site is huge. It represents a lot of work over a long time. It is difficult to know where to begin. I decided to start at what I think was the beginning of it and read straight through the whole thing.

Here is a link to: The Original "Adventures in Emulsion - Making" blog

<http://dwrphotos.com/blog/EmulsionResearch.htm>

All 15 parts and the Overview were read.

Gearing Up

I do not have a 4x5 Mowery blade but I do have the 8x10 one. I also have puddle pushers, coating wells from DR (The Light Farm), and my methods of coating glass.

I started out by using Liquid Light emulsion to coat 4x5 glass, scan them, and print them using a computer printer. There was lots to do pouring plates, exposing, developing, and doing it better.

Now I am gearing up to make emulsion, coat glass and paper, and make those contact prints.

This Salton food heater has a variable dial that is rubbish. It holds on the lo setting and on 1 but then jumps to 3 1/2 like it has a spring in it when it is turned. However, it is perfect on the lo setting and or 1 for melting Emulsion and keeping it warm. The average temperature is 120 degrees F or 48 C. The left pot is 4 degrees F warmer than the one on the right next to the dial. The Right Pot was 118 F Analog or 47.3 C digital / 117 F and the pot on the left was 122 F Analog and 121 F Digital or 49.1 C. Those reading were taken after about 4 hours had passed. The pots had been filled with luke warm water to start with. Readings taken after 2 hours had passed were, Right Pot, Analog 120 F, Digital 117 F & 47 C and the Left Pot was, Analog 122 F, Digital 118.6 F & 48.2 C. There didn't seem to be much variability in the temperature swings but I didn't watch it that closely. This heating pad has lines going across the width of the surface and no other decorations. The other Salton pad was larger and had a circular part along with the lines but it only had a hi lo switch. It was too hot on lo. But don't let that stop you. A rheostat dial could be had cheaply enough and put into a box with two plugs, one in one out. Plug in the heater into that box and dial the temp you want, hi lo or not.

White Darkroom

The darkroom had been painted black. I could not see even when the lights were on. So, I started by painting the ceiling white. Then a wall. Then another. The darkroom had to be cleaned anyway and painting it did that. I washed the floor and some shelves. Man, where they dirty! A major overhaul is needed just so I can wash it down every now and then. It got pretty humid in the darkroom, like when I would pour glass plates. The dehumidifier was moved into the room. Ventilation is very poor. There is a bathroom type fan in the ceiling. When I researched proper darkroom fan setups, mine turned out to be the bad example. Now there are more things to buy. A different fan is needed, more piping for it and a hood over the sink, just sitting on the back of the sink. A filter goes over the input louvers and maybe even another air input near the ceiling.



Much of the darkroom has been cleaned by painting it. Here you can see past the door and the dark curtain into the new space. The floor is no longer black and now I can actually see into the space under the table. The wall behind the table is 20 feet closer to me. The same ceiling light works now but when the room was all black it did not allow me to see much at all.

When that ceiling was black, it was very dark in there.

This photo is blurry because I never take digital flash photos. The camera moved.

Here are some more shots of the new space, messy still, but clean and

bright. The floor needs to dry a couple more days before I can move stuff out from under the sink and paint under there







I found a stainless steel developing tank for 8x10 glass plates under the sink that I didn't know I had. It was so black there that I could not see what was there. Also, the top shelf over the sink was so dirty it was brown, not white. I washed it with TSP. That shelf and other surfaces are rough and difficult to clean. The wall behind the sink is wood and pretty smooth but all the other ones are cement. They benefit from paint applications. Eventually, they will become smoother and easier to wash.



YouTube Research

While I was waiting for the floor paint to dry, YouTube was researched extensively for darkroom subjects. What I found was that I liked paper negatives, waxing paper negatives - large ones, Stand developing, Pyro developer, Salt prints, Gelatin salt prints, coating silver solution with a rod, pre-flashing photo paper to bring out shadow details, urban rot photographs - one photographer was found,

<http://paulraphaelson.com/portfolios/wilderness/#1>

super large prints - one photographer was found - Clyde Butcher,

<https://www.youtube.com/watch?v=PM19W5m5dQg>

The Albumen Process, pushing Tri-x film three stops or more, making digital negatives, direct positive print paper, Rodinal, and as previously mentioned preservation of glass plates. Place the cursor over the address to see a description:

<https://www.youtube.com/user/albumenprocess/videos>

Will Salley and his extensive list of videos

<https://www.youtube.com/watch?v=VIRF90Je8Vw>

St Paul's Photography - Albumen Printing

<https://www.youtube.com/watch?v=AGCLRng9m5w>

Lesson 38: Making Salt Prints With Digital Negatives

https://www.youtube.com/watch?v=GSctXR_7VhI

Printing a negative from an inkjet printer

<https://www.youtube.com/watch?v=Wmf7pcrrl8U>

Paper negatives A Z 1:05:59

<https://www.youtube.com/watch?v=n7Fo8seMrFo>

Waxed Paper Negatives for Contact Printing

<https://www.youtube.com/watch?v=13PGOFqNruU>

Pre Flashing Paper Negatives

<https://www.youtube.com/watch?v=6uZkObAMAsQ>

New Life For Old Cameras, Harmon paper

<https://www.youtube.com/watch?v=pkqZOrcL4sc>

Developing Harmon paper positive

<https://www.youtube.com/watch?v=wtvKrLJmqW0>

FN2: Developing Paper Negatives

<https://www.youtube.com/watch?v=uM5emQuSEhA>

How to Build Your own UV Printer for Alternative Prints

<https://www.youtube.com/watch?v=G31ttvgzwDM>

Darkroom paper fog tests and remedies.

<https://www.youtube.com/watch?v=hY6kKNpFWiM>

Rodinal Semi Stand Development of Large Format Film

<https://www.youtube.com/watch?v=1tF1NVnPAZE>

Pyrogalllic Acid (Pyro): ABC and PMK Developers, Part 1

<https://www.youtube.com/watch?v=04UWlalbSTU>

Amidol Photographic Black and White Developer Formula, Pt. 1

The idea of not needing a darkroom to make big pictures photographically is very appealing to me. Brushing on emulsion is cool, so is scraping it on like with a rod as shown in the St Pauls video starting at 7 min and 30

seconds.

<https://www.youtube.com/watch?v=VIRF90Je8Vw>

That was on Albumen coated paper. The solution did not soak into the paper in this case.

Another method is called the VanDyke process. A brush is used to coat the paper. Here are a number of videos to watch about it.

Final Story Process - Van Dyke Process

<https://www.youtube.com/watch?v=hXmSdDgogxo>

Vandyke brown printing (with pigment toning)

<https://www.youtube.com/watch?v=lm3uGORB2Uo>

VanDyke basic. A priming.

<https://www.youtube.com/watch?v=2-1kQLx0XGs>

More on basic vanDyke - The barn

<https://www.youtube.com/watch?v=4oYvePGwl3U>

Vandyke toning option - the fence

https://www.youtube.com/watch?v=HWnQ9OX_WGk

Gail Erwin demonstrates the Van Dyke Brown photographic process

<https://www.youtube.com/watch?v=HTOoeMMZzvK>

Here is another batch of YouTube and other site threads:

Here is a fantastic thread that is over 39 pages long on shooting on paper and contact printing them on paper. It is on largeformatphotography, forum, LF Forums, Image Sharing & Discussion, Paper negatives. An advanced search yielded many more threads than I had considered looking at. This is the one started by gandolfi:

<http://www.largeformatphotography.info/forum/showthread.php?72984-Paper-negatives&highlight=Paper+negatives>

I was reading on page 30 when I began doing this paper.

<http://www.largeformatphotography.info/forum/showthread.php?72984-Paper-negatives/page26>

And this is the search results:

<http://www.largeformatphotography.info/forum/search.php?searchid=3498014>

Look at this guy's site. He designs lenses and other equipment.

<http://www.re-inventedphotoequip.com>

There is lots to see on APUG about paper negatives, too:

<http://www.apug.org/forums/google.php?cx=partner-pub-1420771393360101%3A9itengilxjw&cof=FORID%3A9&ie=ISO-8859-1&q=Evaluating+Meniscus+Lenses+using+Paper+Negatives&sa.x=-1361&sa.y=-117&siteurl=www.apug.org%2Fforums%2Fhome.php&ref=&ss=16155j8210969j53>

I searched on the title and got that list. Here is the article:

<http://www.apug.org/forums/forum426/102791-evaluating-meniscus-lenses-using-paper-negatives.html>

Paper Negatives:

<http://www.apug.org/forums/forum426/102341-paper-negatives.html> by Reinhold who also links on page 30 to two other articles on pre-flashing papers.

Ilford has an article on paper negatives:

<http://www.ilfordphoto.com/aboutus/page.asp?n=151>

Archive research: Handling glass negatives

<https://www.youtube.com/watch?v=RzJtKHtlueo>

Caring for glass slides & plates

<https://www.youtube.com/watch?v=XwWSh4X-lbM>

Salted paper printing at the Waihora Gallery part One

<https://www.youtube.com/watch?v=lyJoVG7npjc>

Photo Chemistry: Silver Printing on Cotton Paper

<https://www.youtube.com/watch?v=-Q9ow8pla6g>

Calotype sur Papier Sale - [Disactis.com]

<https://www.youtube.com/watch?v=e0YsE0CjsLU>

How to Scan Glass Plate Negatives

On a plate - from glass negative to digital image

<https://www.youtube.com/watch?v=d8S0oMhlcRQ>

How To Scan Glass Plate Negatives at the Luther College Archives do a search on YouTube if you must but...

Read the comments to get the correct technique:

Thank you for the video. However, you are using a few improper procedures for handling and scanning glass plate negatives. Here are a few suggestions:

1. Always wear clean white cotton gloves to prevent transferring contaminants from your hands to the negatives.
2. Do not use pennies to raise the glass plates. They can damage the object. Instead place the glass plate negative emulsion side down (matte side) on the flatbed. This will eliminate most Newton Rings issues and create sharper scans with fixed focus scanners (most Epsoms).
4. Set the scanner in Transparency mode and do not use the white paper backing to diffuse the light. The paper may add unwanted texture or grain to the scans.
5. Scan in uncompressed TIFF 16bit if the scans will be edited in Photoshop. This will preserve image data during image post processing.
6. Do not crop into the image. Scan the entire object and leave an even black border around the image.

These guidelines are based on recommendations from the NARA and the LOC. Have fun!

Read the comments